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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/026, 400	02/19/98	MORI	S 2185-0226P-S

HM12/1014  
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EXAMINER

ZAGHMOUT, O

ART UNIT	PAPER NUMBER
1649	12

DATE MAILED: 10/14/99

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

<b>Office Action Summary</b>	Application No. <b>09/026,400</b>	Applicant(s) <b>Mori et al.</b>
	Examiner <b>Ousama Zaghamout</b>	Group Art Unit <b>1649</b>

Responsive to communication(s) filed on Jul 26, 1999.

This action is **FINAL**.

Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire three month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

#### Disposition of Claims

Claim(s) 1-20 is/are pending in the application.

Of the above, claim(s) 1 and 14-20 is/are withdrawn from consideration.

Claim(s) \_\_\_\_\_ is/are allowed.

Claim(s) 2-13 is/are rejected.

Claim(s) \_\_\_\_\_ is/are objected to.

Claims \_\_\_\_\_ are subject to restriction or election requirement.

#### Application Papers

See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

The proposed drawing correction, filed on \_\_\_\_\_ is  approved  disapproved.

The specification is objected to by the Examiner.

The oath or declaration is objected to by the Examiner.

#### Priority under 35 U.S.C. § 119

Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

All  Some\*  None of the CERTIFIED copies of the priority documents have been received. *No translation was cert. please send a translated copy.*

received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_.

Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

#### Attachment(s)

Notice of References Cited, PTO-892

Information Disclosure Statement(s), PTO-1449, Paper No(s). 5,6

Interview Summary, PTO-413

Notice of Draftsperson's Patent Drawing Review, PTO-948

Notice of Informal Patent Application, PTO-152

*L. J. Smith*  
LYNETTE R. F. SMITH  
SUPERVISORY PATENT EXAMINER  
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-- SEE OFFICE ACTION ON THE FOLLOWING PAGES --

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**DETAILED OFFICE ACTION**

Claims 1-20 are pending.

Applicant's election with traverse of group I , claims 2-13 [ Paper No.10 ] is acknowledged. Claims 1, 14-20 were withdrawn from further consideration as they are drawn to non elected inventions.

The traversal of election is based on the ground(s) that the claims form part and parcel of a single inventive concept and should therefore be examined together. This is not found persuasive because that subject matter can be "related" and yet still be "independent" or patentably distinct. In the instant situation, the different nucleic acids of group I are both independent and patentably distinct. Clearly, they are independent since you could practice one invention, e.g., use the nucleic acid of SEQ ID 1 and 2 in a vector to modify a plant, without practicing or infringing any of the others. Similarly, each is patentably distinct since they constitute different products which can each support its own patent.

The requirement is still deemed proper and is therefore made FINAL.

A signed copy of the PTO 1449 form is enclosed.

Claim 2 is objected to for depending on claim 1, a non-elected claim.

Applicants are respectfully requested to assign a sequence identifiers to any nucleotide sequence of more than 9 bases. Examples of these are in pages 25- 26. The requirements for compliance with sequence rules were sent to Applicants in the previous Office action.

**Claim Rejections - 35 USC § 112**

**Ist Paragraph**

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claims 2, 5-13 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The claims are drawn to a gene which encodes a protein comprising an amino acid sequence represented by SEQ ID NO: 1 or an amino acid sequence having said amino acid sequence with a single or plural amino acid deleted, replaced or added, and having the nicotianamine aminotransferase activity, expression plasmid, host cell therefrom. The claims are further drawn to a process of using said gene. The specification discloses only the nucleotide sequence of SEQ ID: 3 and 4 which encode the amino acid sequence of SEQ ID: 1 and 2. The specification does not disclose the nucleotide sequence of an amino acid sequence

having said amino acid sequence with a single or plural amino acid deleted, replaced or added, and having the nicotianamine aminotransferase activity. Neither the specification nor the prior art teaches the physical characteristics or the chemical property <sup>of</sup> the nucleotide sequence of an amino acid sequence having said amino acid sequence with a single or plural amino acid deleted, replaced or added, and having the nicotianamine aminotransferase activity.

Accordingly, one of skill in the art would not have recognized the applicant to have been in possession of the claimed nucleic acids, the expression plasmid or the transgenic cells and plants therefrom at the time the application was filed. Subsequently, the specification of the instant application does not satisfy the requirement of written description.

2. Claims 2-10 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the nucleotide sequences of SEQ ID: 3 and 4 which encode the amino acid sequences of SEQ ID: 1 and 2, does not disclose other nucleotide sequences encoding amino acid sequences with a single or plural amino acid deleted, replaced or added, and having the nicotianamine aminotransferase activity. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

The breadth of the claims is not commensurate in scope with the enabling support provided. Applicants broadly claim nucleotide sequences encoding amino acid sequences with a single or plural amino acid deleted, replaced or added, and having the nicotianamine

aminotransferase activity, expression plasmid, host cell therefrom. However, the specification discloses only the nucleotide sequences of SEQ ID: 3 and 4 which encode the amino acid sequence of SEQ ID: 1 and 2. The specification does not disclose other nucleotide sequences encoding amino acid sequences with a single or plural amino acid deleted, replaced or added, and having the nicotianamine aminotransferase activity. The specification does not teach a person with skill in the art how to select the amino acid sequence to be deleted, replaced or added and still retains nicotianamine aminotransferase activity, because a very small change in the amino acid sequence of a protein can result in a very large change in the structure-function activity of said protein. Subsequently, it is unpredictable if the claimed but not exemplified sequences will encode a protein having nicotianamine aminotransferase activity. Furthermore, the specification does not have a specific guidance as to how to select the nucleotide sequences which will produce a protein or a polypeptide conferring nicotianamine aminotransferase activity. One wishing to practice the invention is left to proceed through trial-and-error to see what will work and what will not. Hence, due to the lack of any working examples of the inventions, and the inability of one skilled in the art to predict which if any of all possible nucleic acid molecules will be useful in the manner suggested, it would require undue experimentation to practice the invention.

3. Claims 11-13 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for nucleotide sequence of SEQ ID: 3 and 4 which encode

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the amino acid sequence of SEQ ID: 1 and 2, does not disclose a process for enhancing iron absorbing ability of a host cell that is transformed by said nucleotide sequences or nucleotide sequences of an amino acid sequence with a single or plural amino acid deleted, replaced or added, and having the nicotianamine aminotransferase activity . The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

The specification does not teach those with skill in the art if said nucleotide sequences will encode a functional protein having the nicotianamine aminotransferase activity when expressed in a transgenic plant. The specification does not teach a person with skill in the art how to select the amino acid sequence to be deleted, replaced or added and still retain the nicotianamine aminotransferase activity, because a very small change in the amino acid sequence of a protein can result in a very large change in the amino acid sequence of a protein. Furthermore, the specification does not teach if the product of a single gene can mediate the process for enhancing iron absorption ability, or conferring said ability requires more than one gene. The specification does not teach those with skill in the art if the transgenic plant will remain alive after absorption of large excesses of iron which chelate other essential elements in the plant such as phosphorous. The specification does not teach a person with skill in the art if the nucleotide sequences claimed will mediate other steps that follow the absorption of the iron, such as transport or storage. The specification does not teach if the absorbed iron will be partitioned properly in cell compartments without causing any toxic

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effect. One wishing to practice the invention is left to proceed through trial-and-error to see what will work and what will not. Hence, due to the lack of any working examples of the inventions, and the inability of one skilled in the art to predict which if any of all possible nucleic acid molecules will be useful in the manner suggested, and the unpredictability of the field, it would require undue experimentation to practice the invention.

**112 2nd paragraph**

Claim 2 and dependent claims 3-10, 13 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 does depend on claim 1. Therefore, in the interest of compact prosecution, the limitations of claim 1 were read on claim 2. As such, claim 2 and dependent claims are rejected under 35 U.S.C. § 112, second paragraph, as being vague and indefinite for the recitation of “ deleted, replaced or added”. These words are not defined in the specification in a clear and concise manner. It is not known where in the amino acid sequence the deletion, the replacement or the addition of amino acid residues will take place. Furthermore, it is not known what amino acids are included or excluded in the changes. As such, the metes and the bounds of changes are not known.

**Conclusion**

No claims are allowed.

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**Future Correspondence**

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ousama M-Faiz Zaghmout whose telephone number is (703) 308-9438. The Examiner can normally be reached Monday through Friday from 7:30 am to 5:00 pm (EST).

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, L. Smith, can be reached on (703) 308-3909. The fax phone number for the group is (703) 305-3014.

Any inquiry of a general nature or relating to the status of this application should be directed to THE MATRIX CUSTOMER SERVICE CENTER whose telephone number is (703) 308-0196.

Ousama M-Faiz Zaghmout Ph.D.

October 6, 1999